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STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

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Fatal Accidents Most Frequent Under Age Five

THE outstanding opportunity of the American safety movement is to curb accidents among very young children—in fact among those under age 5. It is among these youngsters that fatal accidents are most numerous. The danger of accidental death is then nearly twice what it is between ages 5 and 15. The fact that the accident deathrate, in the United States, for the three-year period 1929–1931 was actually 67 per 100,000 for the small children, as against only 37 for those of school age, is convincing evidence as to where the greater hazard lies. In the pre-school years, accidents are among the chief causes of death. The total, in fact, exceeds the combined number due to measles, scarlet fever and diphtheria.

Boys are more prone to fatal accidents than are girls. Comparing the deathrates of the two sexes, age by age, we find that below 5 that for boys is higher than that for girls by almost one-third; between 5 and 10 years, it is almost twice as high, and between 10 and 15 it is three and one-half times the rate for girls. The accident rates for the two sexes are nearest alike before age 5. This is not surprising when we consider that the play environment before 5 is much the same for both boys and girls. It is only at the school ages, when boys engage in more venturesome play, that the accident rates for the sexes diverge.

Children, like grown-ups, are killed by all manner of accidents, but the ones of greatest frequency below age 5 are burns, automobile accidents, mechanical suffocation, drowning, falls and poisonings. Together, these six account for 73 per cent. of all the accidental deaths. Burns and scalds, especially the latter, account for nearly one-quarter of all fatal accidents at ages under 5 years. Burns from lighted matches and from stoves and open grates result in significant numbers of deaths to small children. Automobile accidents cause the deaths of nearly as many small children as do burns. Mechanical suffocation has a prominent place in the list of accidental causes under age 5, but the deaths, in the main, are of babies under one year old, who are accidentally smothered in bed. Nearly one-half of the total fatal accidents to babies occur in this manner.

That far from all the fatal accidents to small children occur in and about the home is shown by the comparative frequency of the several types of accidents. The records of the Metropolitan Life Insurance Company, for recent years, indicate that while 55 per cent. of the accidents between ages 1 and 5 occur there, the remainder happen on the streets and in other places outside the home. In the case of babies, practically all accidents occur in the home, as would be expected.

There is, nevertheless, one encouraging aspect of the child accident situation, namely, that the death-rate has declined 20 per cent. in the last ten years. This should serve to stimulate both public and private safety organizations to even greater efforts to reduce the number of accidental deaths among young children in this country.

Chief Causes of Accidental Deaths Among White Children Under Age Five, United States, 1929–1931*

Cause of Death	Number of Deaths	Per Cent. of Total
Total Accidents	16,141	100
Burns (conflagration excepted)	3,657	23
Automobile accidents	3,401	21
Mechanical suffocation	1,484	9
Drowning	1,203	7
Traumatism by fall	1,126	7
Poisonings	962	6
Other accidents	4,308	27

*34 States and District of Columbia.

Are Poets and Musicians Short-Lived?

If we make a quick mental survey of some of the outstanding poets and musicians, it is very easy for us to gain the impression that they tend to be a short-lived group of persons. Among poets we have the names of Chatterton who died at the age of 19, Shelley at the age of 30, Keats 26, Poe 40, Burns 37, to quote a few outstanding examples. Among musicians there readily come to mind the names of Chopin, who died at the age of 39, Mendelssohn at the age of 38, Mozart at 35, Schubert at 31, Schumann 46, and Weber 40. Such lists as these might make us think that both poets and musicians as a group are short-lived.

On the other hand, in running through our mental recollection of some of the principal mathematicians, we find such facts as these: James Bernoulli died at the age of 51, and John Bernoulli at the age of 81, Bessel 62, Cantor 73, Cauchy 68, Cayley 74, Chrystal 60, Copernicus 70, Cournot 76, De Moivre 87, Euler 76, Fermat 64, Fourier 62, Gauss 78, Hamilton 68, Helmholtz 73, Lagrange 77, Laplace 78,

Legendre 81, Leibnitz 70, Sir Isaac Newton 85, Stirling 78, Stokes 84, Sylvester 83, Todhunter 64. This list of some of the most famous names among mathematicians might lead us to think that these men as a group are distinctly more long-lived than men who have become great in the arts of poetry or music.

In fact, an early statistical examination by R. R. Madden (1833), definitely stated such a conclusion. Madden calculated the average age at death of poets as 57 years, musicians 64, and natural philosophers as 75 years. Madden's lists, however, contained only 20 names of famous persons in each of his groups studied. Conclusions based on such a small sample are far from reliable. Is it possible that in the lists cited above we have been biased in remembering musicians that died early, and similarly biased in remembering predominantly mathematicians that have lived long?

To answer this question a list has been prepared of 81 names of musicians, 75 poets and 82 mathematicians. Care was taken to select them quite irrespective of their age at death, the person selecting being at the time ignorant of the age at death of each celebrity on the list. After the list had been thus completed, the average age for each of the three groups was determined. The result hardly bears out Madden's conclusions. The average age at death of the poets was 64.05 ± 1.76 years. The average age of musicians was 62.27 ± 1.63 years, and, lastly, the average age of mathematicians was 64.26 ± 1.68 years. It is true that we find here mathematicians with a slightly higher age at death than poets, and these in turn with a somewhat higher age at death than the musicians. But when the usual statistical test is applied to the differences, it is found that we can hardly attach much significance to them. Especially the difference between mathematicians and poets, which is only one-fifth of a year, cannot be regarded as significant as compared with its standard error, which figures out to 2.4 years. The difference between musicians and mathematicians is 2 years, but even this is not significant as compared with its standard error of 2.3 years.

The list with which we began is, therefore, distinctly biased. It seems that one naturally thinks first of the poets and musicians who died young, such as Schubert, Chopin, Chatterton, Shelley, Keats, while in the case of mathematicians the bias seems to be in the other direction, although one does recall the early death of Galois 20, and of Abel 27. It would, no doubt, be interesting to extend this examination to still larger samples, so as to reduce the probable errors, and to enable us to establish finer distinctions. There are some reasons why we might well expect musicians and poets to show lower ages at death than mathematicians. One of these reasons is very obvious, namely that a mathematician requires a degree of training and experience that makes it very difficult for him to become famous before midlife, although some mathema-

ticians have achieved high fame in their early twenties. On the other hand, musicians are often very precocious, and to some extent this is true of poets also. Whether the mode of life and the mental attitude of these widely different groups of persons has any influence on their length of life is a question that one might very well raise. From the figures noted above it would seem that any such influence is slight.

Coronary Disease: A New Problem in Public Health

IN THE last few years, quiet but revolutionary changes have taken place in the concepts regarding heart disease. Probably the most important is the growing appreciation of the significance of diseases of the coronary arteries which supply blood to the heart muscle. Wide attention was directed to coronary disease early last year because of the sudden death from it of ex-President Coolidge and shortly after of former Senator Walsh, on the eve of his taking his place as a member of the new Cabinet. In the course of the past year, coronary disease has caused the deaths of several other prominent persons, among them former Senator GILBERT M. HITCHCOCK, OTTO H. KAHN, the banker, JOHN D. RYAN, the copper magnate, and HERBERT N. STRAUS, the merchant.

A striking evidence of the recognition of the importance of coronary disease is the very rapid increase in the number of deaths ascribed to it. For example, among the Industrial policyholders of the Metropolitan Life Insurance Company, the recorded deathrate from coronary disease has risen from 4.7 per 100,000 in 1930, when mortality statistics on the disease first became available, to 13.5 in 1933, an increase of nearly 200 per cent. in the short space of three years. Similarly, a large increase—from 11.1 in 1930 to 24.6 in 1933—has been recorded among Ordinary policyholders of the Company. These figures actually understate the mortality from this condition because it is responsible for a large number, if not most, of the deaths attributed to angina pectoris, the deathrate from which is now about equal to that from coronary disease. An increase in the coronary deathrate has been recorded at every age period in adult life, both in men and women and for negroes as well as whites. It is clear, then, that the disease is not only an important cause of death today but if present trends continue it may be expected within a few years to rank high among the leading causes.

The significance of coronary disease was first noted by EDWARD JENNER, the famous discoverer of vaccination for smallpox, over 150 years ago. He found changes in the coronary artery in two individuals who had died after attacks of angina pectoris. Doubt was cast upon the significance of his discovery by later

authors who reported finding normal coronary arteries in individuals dying of angina. Interest in the subject, for a long time dormant, was revived by a report of JAMES B. HERRICK, an American physician, in 1912, on the effect of obstruction of the coronary artery, and by another paper of the same author in 1919. Herrick's brilliant exposition of the subject aroused much attention. Physicians came to be on the lookout for cases of the disease and research in its causes and manifestations was markedly stimulated.

Coronary disease is distinctly an affliction of middle and later life. Deaths from the condition are rare under the age of 35. The frequency of the disease rises rapidly with age thereafter. Between ages 30 and 40, the deathrate increases about fivefold; over threefold between 40 and 50; over twice between 50 and 60 and doubles again between 60 and 70. The rate is somewhat higher in extreme old age. Deaths from the disease are over twice as frequent in men as in women, but some of this difference may be due to better diagnosis of the disease in men. The same explanation may hold, in part, for the low deathrate of colored persons from coronary disease. Premature death from this condition, as from the other degenerative diseases, is relatively frequent among obese persons. It is often associated with diabetes in older persons and is, in fact, one of the leading causes of death of diabetics today.

The disease results chiefly from the hardening of the coronary arteries. Willius and his colleagues* at the MAYO CLINIC have reported that this condition, present in slight degree even in the first decade of life, increases rapidly in frequency with advancing age, and by age 60, practically all individuals are affected in some degree. The severity of the condition was found to be greater at the older ages. Coronary disturbance may also be due to poor functioning of the nervous system of the artery, the result being a sudden spasm of the artery. Some cases, especially in the late thirties and early forties, have been ascribed to coronary changes due to syphilis.

These types of coronary change interfere with the blood supply of the heart muscle, which the coronary arteries serve. This may result from the narrowing of the artery by sclerosis. In these cases anginal pains may occur, especially after prolonged or unaccustomed exercise, but sometimes even on slight effort. The severity of the pain forces the victim to rest and he may recover from the attack. In fact, many attacks may occur before death. Another frequent source of trouble, usually associated with sclerosis, is the formation of a thrombus—a fixed clot—in one of the coronary arteries or a main branch. As a result, death often occurs without any previous warning because the blood supply of a large portion of the heart is cut off.

The rapidly mounting toll of deaths from coronary disease in re-

*Willius, F. A., Smith, H. L., and Sprague, P. H., Proceedings of the Staff Meetings of the Mayo Clinic, Vol. 8, p. 140, March 1, 1933.

cent years represents, in large degree, only an apparent increase in the condition. In this respect, it merely reflects the more frequent diagnosis of a disease which heretofore escaped attention and indeed was practically unrecognized two decades ago. This is especially true in many sudden deaths, which formerly were ascribed to heart disease, apoplexy, or acute indigestion, but which now, from the medical history of the deceased, are known to be due to coronary disease. The experience at the Presbyterian Hospital in New York City, reported by Levy and his co-workers,* is typical. There, in the ten years prior to 1920, coronary disease was diagnosed in only seven patients among 40,682 admissions, whereas today about eight in every 1,000 patients are reported as suffering from this impairment. Moreover, in the period 1910 to 1919, advanced sclerosis was recognized before death in only 2 per cent. of the cases in which its presence was demonstrated by autopsy, and thrombosis was diagnosed in life in only 19 per cent. of the cases in which it was found on autopsy. Even in recent years only 16 per cent. of the former and 43 per cent. of the latter have been diagnosed before death.

A real increase in the frequency of coronary disease, over and above that due to better diagnosis, seems to be taking place. This is indicated by Levy's study of autopsies which showed an increase in the condition at every age period, but more especially between 25 and 65. We do not know yet why coronary disease is increasing. The rapid pace of modern life is often blamed, because those who work under great nervous tension seem especially prone to the disease—for example, physicians, industrial executives and business leaders. These claims, however, have not been clearly proved and we do not think that they account for the increase. There is reason to believe, on the other hand, that the upward trend in coronary disease is part and parcel of the increase recorded in cardiovascular diseases generally. To some extent this is inevitable because of the growing proportion of older persons in our population, which has resulted largely from the declining mortality from infectious diseases. Beyond that, an explanation of the real increase in these cardiovascular conditions, including coronary disease, for which evidence is gradually accumulating, is that older persons today, among whom these conditions are exacting their increasing toll, are probably constitutionally inferior to those surviving to old age in the past. It has been suggested, for example, that many middle aged and old persons living today have sustained varying degrees of arterial damage from aborted infections which were formerly fatal. Continued and intensive study of the many aspects of the problem should help us before long to settle the vital question of whether this increase in coronary disease is a real one.

*Levy, R. L., Bruenn, H. G., and Kurtz, D., *American Journal of the Medical Sciences*, Vol. 187, p. 376, March 1934.

Improved Mortality Reduces the Chances of Orphanhood

REDUCED mortality among parents means reduced chances of orphanhood for their children. How does the new life table for 1929-1931 compare in this respect with that of a decade earlier? What has happened in the last 10 years to the chance of a child being orphaned? The answer is shown graphically in the accompanying chart. It will be seen that for a child born when the father is 25 years old, the chances of becoming an orphan before reaching the age of 17 were 103 per 1,000 according to the mortality of 1920; this figure has been reduced to 77 per 1,000 according to the life table of 1929-1931. Similarly, for a child born when the father was 30 years old, the chances of orphanhood according to the mortality of 1920 were 117 per 1,000; according to the life table of 1929-1931, this figure is reduced to 98 per 1,000. For a child born when the father was 35 there is very little difference in the chances of becoming an orphan, the figures being 134 per 1,000 according to the 1920 life table and 129 per 1,000 according to the 1929-1931 mortality. Somewhere between the ages 35 and 40 of the father is a point at which the two chances are identical, and if the father is as much as 40 years old at the time the child is born, there is actually a somewhat greater chance of orphanhood according to the later than according to the earlier life table—168 per 1,000 according to the 1920 mortality and 174 per 1,000 according to the mortality rate registered in 1929-1931.

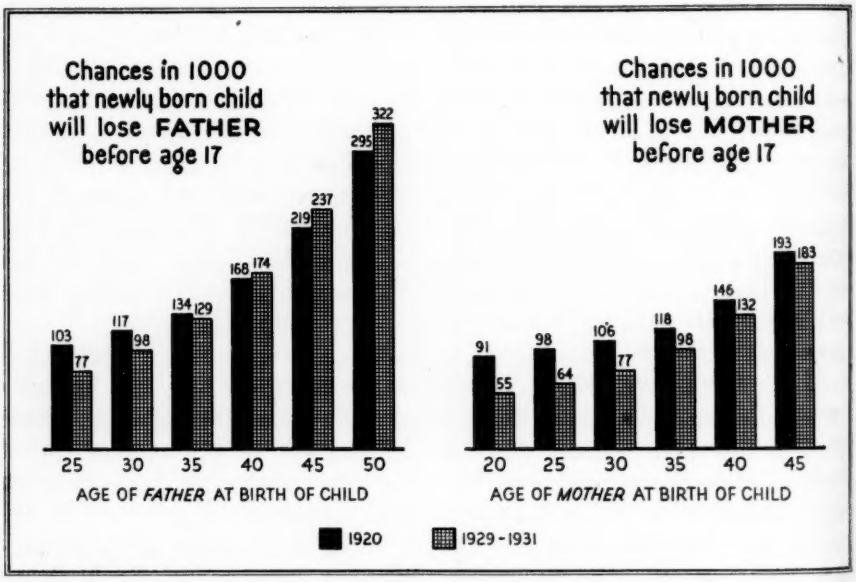
It is regrettable but true that for children born when the father is more than 40 years old the chances of orphanhood according to the 1929-1931 mortality progressively exceed by an increasing amount these computed according to the mortality ten years earlier. The explanation for this increasingly adverse comparison as the father's age at the time of the birth of the child increases, resides in the fact that the mortality table for white males shows an actual change for the worse at high ages of life, as compared with that for 1920. Fortunately, this effect, which shows itself in the diagram in the gray shaded bars overtopping the black, is not a very serious matter so far as orphanhood is concerned, because the majority of children are born before the father reaches age 40, the average age of the father at the birth of the children being about 32 years.

When we compare in the accompanying diagram the right hand group of bars, relating to the chances of a child losing its mother, with the group on the left which relates to the probability of a child losing its father, we are struck at once with a very obvious contrast. Throughout the entire range of the parents' age, the probability of losing the mother is materially less than that of losing the father. This is, of

course, the direct result of the lower mortality of women, as compared with men. But another feature is now brought out by the present diagram, namely, that in the case of maternal orphanhood the change in the mortality from 1920 to 1929-1931 has throughout reduced the chances of the child losing its mother before reaching age 17. Or, to speak in terms of the diagram, the shaded bars are in every case shorter than the black bars. Even if the mother is 45 at the time the child is born, which comes very near the extreme limit of ordinary events, the chances of a child being left a maternal orphan are 10 per 1,000 less according to the later life table than according to the earlier one, namely, 183 per 1,000 instead of 193 per 1,000. For younger mothers the contrast is greater, and for mothers who are only 20 years old when the child is born, the chances of orphanhood are not very much more than half of what they were by the early table, namely, 55 per 1,000 by the recent, and 91 by the older table.

CHANCES OF ORPHANHOOD BEFORE REACHING AGE 17

According to Mortality as of 1920 and as of 1929-1931 compared



Improved mortality means many advantages to the community, and not the least important is the striking reduction in the chance of orphanhood for young children with all the heavy burdens entailed by this condition.

Health Record for July, 1934

As we have indicated in previous numbers of the Statistical Bulletin, health conditions during the current year, although good, have not equalled those which prevailed in the two most recent years. The surest indication that there has been a rise in the deathrate in the United States, this year, is the mortality record of the many millions of Metropolitan Industrial policyholders. This rise for the seven-month period ending with July amounted to 3.8 per cent, as compared with 1933. Figures released by the United States Public Health Service show an even larger increase in the mortality of the general population of the 86 large cities, that is, 5.3 per cent. Among the insured group, however, there has been no increase in mortality either among approximately one million policyholders living in the Pacific Coast and Mountain States or among a like number of Canadians. The cumulative deathrate for each of these two groups, in fact, is almost identical with that for the January-July period of 1933, and that for the Canadians is at the lowest point recorded for this part of the year.

The deathrate for the month of July was 8.0 per 1,000, which is slightly below the July average for Metropolitan Industrial policyholders since 1920, namely, 8.1.

There are decidedly favorable and equally unfavorable aspects in the 1934 record for the principal causes of death. It is already assured that the year will register new lows for diphtheria and tuberculosis, and will record near-minimal rates for diarrheal diseases and puerperal conditions. Influenza mortality has been lower than for years. Improvement in the economic situation of the country has been reflected in fewer suicides, and it is probable that the suicide deathrate will be lower than for any year since 1929. Furthermore, there have been fewer homicides per 100,000 policyholders this year, to date, than ever before.

On the other hand, there have been considerable increases in the crude deathrates for cancer (6.7 per cent.), diabetes (7.3 per cent.), heart disease (5.9 per cent.), pneumonia (15.9 per cent.), accidents (7.4 per cent.) and automobile fatalities (13.8 per cent.). Doubtless, the increases for heart disease, cancer and diabetes were due, in part, to the higher average age of the insured. This factor, nevertheless, does not account for all of the increase; for no corresponding rises have been observed for cerebral hemorrhage and chronic nephritis, which, like heart disease, cancer and diabetes, register the great majority of their deaths in the higher age ranges. It is difficult to account for the sharp rise observed for pneumonia. It has occurred during the very period that has witnessed an abrupt drop in deaths from influenza. This is an unusual phenomenon. The very cold winter doubtless played a part; but an unusually high pneumonia

deathrate also prevailed during the spring and early summer.

The deathrate in the general population of the large cities of the United States, in July, was 10.8 per 1,000 estimated population, as compared with 10.7 in June, and 9.7 in July, 1933. With the exception of typhoid fever, all of the principal communicable diseases were less prevalent in July than in June. Comparison with July of last year shows that there was more sickness, in 1934, from measles, poliomyelitis and scarlet fever, but less from diphtheria, influenza, smallpox and typhoid fever.

Reports from 46 States show a decline in poliomyelitis cases from 1,319 in June to 1,069 in July. There has been marked improvement in California, where cases dropped from 1,183 in June to 747 in July; but there are indications that the epidemic has spread to the States of Washington and Idaho.

The following items are of special public health interest. The State health authorities of Rhode Island report that the first six months of 1934 have passed without a single death from diphtheria occurring in that State. This is indeed a remarkable record. The first of a series of indoor pools for hydrogymnastics for victims of poliomyelitis in New York was opened recently at Christodora House. The opening of this pool is the first step in a movement initiated with the hope of rehabilitating some of the thousands of young victims of poliomyelitis in New York City. The National Health Council, the American Medical Association, several medical societies, the United States Public Health Service, State and municipal health authorities, and social welfare agencies are cooperating in a joint campaign to prevent congenital syphilis. Its two primary purposes are to bring about early medical examination of every pregnant woman, which will include a blood test for syphilis, and to provide early and adequate treatment of those found to be infected.

In a number of cities intensive safety campaigns are already in operation or are about to be launched. In Cleveland, 250 leading citizens are serving on a local cooperative program to bring about increasing interest in accident prevention. Fifty large New York City corporations plan to launch, in September, a six months' home safety campaign among workers and their families. Wide use will be made of educational posters; there will be home inspections and all accidents will be recorded. In Chicago, Mayor Kelly is starting a drive for better automobile traffic law enforcement. In an effort to reduce deaths from automobile accidents, a system of compulsory mechanical inspection of automobiles has been inaugurated in Memphis. The result has been that since last April automobile fatalities have been reduced 25 per cent. It is planned to test brakes, lights, windshield wipers, steering wheel alignment, etc., every six months. If a car fails to pass inspection, the owner is given seven days in which to have repairs made.

The following table shows the mortality among Industrial policyholders for July, 1934; June, 1934, and July, 1933, together with the cumulative rates for the first seven months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Deathrates per 100,000 for Principal Causes. Weekly Premium-Paying Business in Industrial Department. All Ages (Annual Basis).*

MONTHS OF JULY, 1934; JUNE, 1934, AND JULY, 1933

CAUSES OF DEATH	ANNUAL RATE PER 100,000 LIVES EXPOSED*				
	July 1934	June 1934	July 1933	Cumulative January-July	
				1934	1933
TOTAL—ALL CAUSES	802.9	839.1	724.8	925.9	892.2
Typhoid fever	2.3	.8	2.2	1.2	1.0
Measles	1.6	3.6	1.2	4.3	2.2
Scarlet fever	1.7	2.7	1.0	3.2	3.3
Whooping cough	3.2	4.6	2.5	4.1	2.3
Diphtheria	1.5	1.7	1.9	2.0	2.3
Influenza	3.2	5.6	3.1	14.6	28.5
Tuberculosis (All forms)	61.1	63.0	60.8	64.1	67.1
Tuberculosis of respiratory system	52.7	55.3	54.2	56.4	59.8
Cancer (All forms)	97.1	96.3	86.2	98.1	91.9
Diabetes mellitus	22.1	23.1	17.0	26.5	24.7
Cerebral hemorrhage; apoplexy	60.8	61.2	54.9	68.8	66.4
Diseases of heart†	149.2	157.5	129.6	179.7	169.7
Pneumonia (All forms)	35.4	53.3	26.8	83.7	72.2
Other respiratory diseases	7.9	9.0	7.0	10.7	10.5
Diarrhea and enteritis	13.8	10.1	12.2	8.6	8.4
Chronic nephritis (Bright's disease)	61.2	65.4	53.9	70.6	68.9
Puerperal state—Total	9.4	8.9	7.2	9.9	9.8
Suicides	9.4	9.5	9.1	9.9	10.2
Homicides	5.0	5.2	5.9	5.6	6.0
Accidents—Total	68.9	59.9	63.1	56.8	52.9
Automobile accidents	22.5	20.0	18.0	19.8	17.4
All other diseases and conditions	188.2	197.7	179.2	203.5	193.8

*The rates for 1934 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†Excludes pericarditis, acute endocarditis, acute myocarditis and angina pectoris.

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STATISTICAL BULLETIN,

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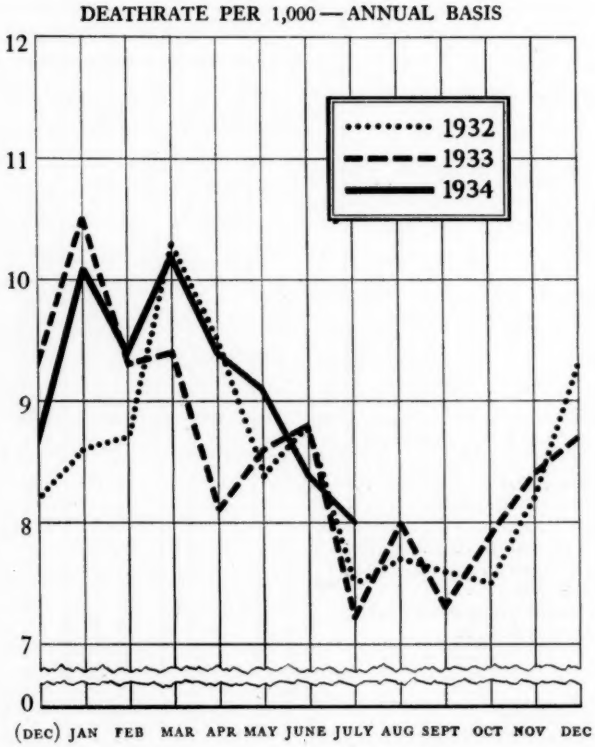
DEATHRATES FROM ALL CAUSES

in the Metropolitan Life Insurance Company
Industrial Department



1932	8.6	8.7	10.3	9.5	8.4	8.8	7.5	7.7	7.6	7.5	8.2	9.3
1933	10.5	9.3	9.4	8.1	8.6	8.8	7.2	8.0	7.3	7.9	8.4	8.7
1934*	10.1	9.4	10.2	9.4	9.1	8.4	8.0					

* *Rates for 1934 are provisional.*

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